CLAIMS:

1. A semiconductor processing system comprising:
   a) a pod loader;
   b) a transfer robot;
   c) a load lock comprising:
      i) a chamber; and
      ii) a load lock robot disposed in the chamber; and
   d) a process chamber.

2. The system of claim 1 wherein the load lock further comprises:
   a) a bottom having one or more perforations; and
   b) one or more lift pins slidably disposed through the one or more perforations.

3. The system of claim 2 wherein the lift pins are coupled at one end to a linear actuator.

4. The system of claim 1 wherein the load lock further comprises a vacuum pump.

5. The system of claim 4 wherein the vacuum pump is in fluid communication with the chamber.

6. The system of claim 1 wherein the load lock further comprises an elongated substantially rectangular aperture.

7. The system of claim 6 wherein the load lock further comprises a hermetic sealing apparatus adapted to substantially cover the aperture.

8. The system of claim 7 wherein the hermetic sealing apparatus comprises a slit valve.

9. The system of claim 7 wherein the hermetic sealing apparatus comprises a gate valve.

10. The system of claim 1 wherein the load lock further comprises:

a) a cover defining an opening; and

b) a lid adapted to substantially cover the opening.

11. The system of claim 10 wherein the lid further comprises at least one stabilizing rod disposed through the lid and connected to the cover.

12. The system of claim 10 further comprising a transfer assembly adapted to transfer one or more objects to a plurality of positions.

13. The system of claim 12 wherein the transfer assembly comprises:

a) two pairs of rotational and vertically slidable lifting members each pair being disposed through a pair of bores formed vertically through the lid;

b) a wafer lifting element attached to each lifting member at a first end; and

c) one or more actuators attached to each pair of lifting members at a second end.

14. The system of claim 13 wherein the one or more actuators impart vertical and rotational movement to each lifting member.

15. The system of claim 13 wherein each pair of lifting members cooperate to transfer an object to a plurality of positions.

16. The system of claim 1 wherein the load lock robot comprises:

a) a symmetrical linkage assembly comprising

i) a first drive arm having a first end and a second end, the first drive arm being rotatable about a first axis at its first end;

ii) a second drive arm having a first end and second end, the second drive arm being rotatable about a second axis at its first end, the first and second drive arms being separated by a distance greater than a wafer diameter in their extended positions such that a wafer may be vertically transferred between the drive arms;

iii) a first strut that is connected to the first drive arm at a first pivot joint; and

iv) a second strut that is connected to the second drive arm at a second pivot joint, the first and second pivot joints defining a lagging axis; and

b) a blade pivotally connected to the first strut at a first wrist joint and the second strut at a second wrist joint, the first and second wrist joints defining a leading axis which remains constantly parallel to, and horizontally displaced from, the lagging axis .

17. The system of claim 16 wherein the blade is extended by the simultaneous and synchronous clockwise rotation of the first drive arm and counterclockwise rotation of the second drive arm.

18. The system of claim 16 wherein the blade is retracted by the simultaneous and synchronous counterclockwise rotation of the first drive arm and clockwise rotation of the second drive arm.

19. The system of claim 1 wherein the load lock is connected to the process chamber.

20. A load lock comprising:

a) a chamber;

b) a load lock robot disposed in the chamber; and

c) a process chamber attached to the chamber.

21. The apparatus of claim 20 wherein the load lock further comprises:

a) a bottom having one or more perforations; and

b) one or more lift pins slidably disposed through the perforations.

22. The apparatus of claim 21 wherein the lift pins are coupled at one end to a linear actuator.

23. The apparatus of claim 20 wherein the load lock further comprises a vacuum pump.

24. The apparatus of claim 23 wherein the vacuum pump is in fluid communication with the chamber.

25. The apparatus of claim 20 wherein the load lock further comprises an elongated substantially rectangular aperture providing for fluid communication between the chamber and the process chamber.

26. The apparatus of claim 25 wherein the load lock further comprises a hermetic sealing apparatus adapted to substantially cover the aperture.

27. The apparatus of claim 26 wherein the sealing apparatus is a slit valve.

28. The apparatus of claim 26 wherein the sealing apparatus is a gate valve.

29. The apparatus of claim 20 wherein the load lock further comprises:

a) a cover defining an opening; and

b) a lid adapted to substantially cover the opening.

30. The apparatus of claim 29 further comprising a transfer assembly adapted to transfer one or more objects to a plurality of positions.

31. The system of claim 30 wherein the transfer assembly comprises:

a) two pairs of rotational and vertically slidable lifting members each pair being disposed through a pair of bores formed vertically through the lid;

b) a wafer lifting element attached to each lifting member at a first end; and

c) one or more actuators attached to each pair of lifting members at a second end.

32. The system of claim 31 wherein the one or more actuators impart vertical and rotational movement to each lifting member.

33. The system of claim 31 wherein each pair of lifting members cooperate to transfer an object to a plurality of positions.

34. The apparatus of claim 20 wherein the load lock robot comprises:

a) a symmetrical linkage assembly comprising

i) a first drive arm having a first end and a second end, the first drive arm being rotatable about a first axis at its first end;

ii) a second drive arm having a first end and second end, the second drive arm being rotatable about a second axis at its first end, the first and second drive arms being separated by a distance greater than a wafer diameter in their extended positions such that a wafer may be vertically transferred between the drive arms;

iii) a first strut that is connected to the first drive arm at a first pivot joint; and

iv) a second strut that is connected to the second drive arm at a second pivot joint, the first and second pivot joints defining a lagging axis; and

b) a blade pivotally connected to the first strut at a first wrist joint and the second strut at a second wrist joint, the first and second wrist joints defining a leading axis which remains constantly parallel to, and horizontally displaced from, the lagging axis .

35. The apparatus of claim 34 wherein the blade is extended by the simultaneous and synchronous clockwise rotation of the first drive arm and counterclockwise rotation of the second drive arm.

36. The apparatus of claim 34 wherein the blade is retracted by the simultaneous and synchronous counterclockwise rotation of the first drive arm and clockwise rotation of the second drive arm.

37. An apparatus for transferring objects between a first position and a second position comprising:

a) a symmetrical linkage assembly comprising

i) a first drive arm having a first end and a second end, the drive arm being rotatable about a first axis at its first end;

ii) a second drive arm having a first end and second end, the drive arm being rotatable about a second axis at its first end;

iii) a first strut that is pivotally connected to the first drive arm at a first pivot joint; and

iv) a second strut that is pivotally connected to the second drive arm at a second pivot joint, the first and second pivot joints defining a lagging axis; and

b) a blade pivotally connected to the first strut at a first wrist joint and the second strut at a second wrist joint, the first and second wrist joints defining a leading axis remaining constantly parallel to, and horizontally displaced from, the lagging axis.

38. A method for transferring wafers between a plurality of positions comprising:

a) providing a load lock comprising:

i) a chamber; and

ii) a first transfer assembly disposed in the chamber, the first transfer assembly occupying a first horizontal plane;

b) disposing a wafer onto the first transfer assembly; and

c) actuating the first transfer assembly.

39. The method of claim 38 wherein actuating the first assembly comprises the steps of:

a) lowering the first transfer assembly along the first plane; and

b) raising the first transfer assembly along the first plane.

40. The method of claim 38 further comprising the steps of:

a) providing a second transfer assembly disposed in the chamber, the second transfer assembly occupying a second plane substantially perpendicular to the first plane;

b) positioning a wafer on the second transfer assembly; and

c) actuating the second transfer assembly.

41. The method of claim 40 wherein positioning the wafer onto the second transfer assembly comprises the steps of:

a) lowering the first transfer assembly along the first plane from a position above the second plane to a position coplanar with the second plane, the first transfer assembly carrying the wafer;

b) depositing the wafer onto the second transfer assembly;

c) retracting the first transfer assembly; and

d) raising the first transfer assembly.

42. The method of claim 41 wherein depositing the first transfer assembly from the wafer, the first transfer assembly comprising a pair of rods diametrically placed rods respecting the wafer and a lifting element coupled to each rod at one end, the wafer gravitationally resting on the lifting elements, comprises the steps of rotating the first transfer assembly about a central axis, such that the lifting elements are removed from one another a distance greater than the diameter of the wafer.

43. The method of claim 40 wherein actuating the second transfer assembly comprises the steps of:

a extending the second transfer assembly along the second plane; and

b) retracting the second transfer assembly along the second plane.

44. A method for transferring wafers between a plurality of positions comprising:

a) providing a load lock comprising:

i) a chamber;

ii) a first transfer assembly disposed in the chamber, the first transfer assembly moving along a vertical first plane; and

iii) a second transfer assembly disposed in the chamber, the second transfer assembly moving horizontally along second plane perpendicular to the first plane;

b) positioning at least two wafers onto the first transfer assembly;

c) lowering the first transfer assembly

d) positioning a first wafer onto the second transfer assembly;

e) raising the first transfer plane;

f) extending the second transfer assembly beyond the load lock, the second transfer assembly carrying the first wafer;

g) retracting the second transfer assembly;

h) lowering the first transfer assembly;

i) removing the first wafer from the second transfer assembly; and

j) raising the first transfer assembly above the second plane;

45. A method for transferring a wafer into and out of a load lock, the load lock comprising a lid and a transfer assembly, the method comprising the steps of:

a) raising the lid above a transfer plane;

b) raising the transfer assembly above the transfer plane;

c) positioning a wafer on the transfer assembly;

d) lowering the transfer assembly below the transfer plane; and

e) lowering the lid below the transfer plane.